BELL SYSTEM REPAIR SPECIFICATION

RINGERS

E TYPE

This index lists the information that forms a part of, or supplements this specification, and indicates the authorized issues thereof.

PAGE 1 , ISSUE		13*	14	15									
DATE	Prev. Auth.	1-79	8-79	4-82									
NUMBER	ISSUES AUTHORIZED ON ABOVE DATE												TITLE
Page 2	5	6											
Page 2A		1											
Page 3	4	5											
Page 4	9	9											
Page 5	8	9	10										
Page 6	5	6											
Page 7	2	3											
Page 8	1	2											
Page 9		1											
Page 10		1		2									
SUPL SPEC													
BSRS-350.001	c												General Requirements

c—Information in accordance with that currently authorized.

*Changes are numerous and preclude the use of arrows.

File in Handbook:
RS-560, Book 3, Tab A
IP-3R, RS-560J

Bell Telephone Laboratories, Incorporated - Dept 3315-JFF/~~512-JAM~~ 5527GJO Printed in U.S.A.

RINGERS

E TYPE

This index lists the information that forms a part of, or supplements this specification, and indicates the authorized issues thereof.

PAGE 1 , ISSUE		13*											
DATE	Prev. Auth.	1-79											
NUMBER	ISSUES AUTHORIZED ON ABOVE DATE												TITLE
Page 2	5	6											
Page 2A		1											
Page 3	4	5											
Page 4	9	9											
Page 5	8	9											
Page 6	5	6											
Page 7	2	3											
Page 8	1	2											
Page 9		1											
Page 10		1											
SUPL SPEC													
BSRS-350.001	c												General Requirements
BSRS-350.003		c											General Requirements Telephone Sets

c—Information in accordance with that currently authorized.

*Changes are numerous and preclude the use of arrows.

File in Handbook:
RS-560, Book 3, Tab A
IP-3R, RS-560J

Bell Telephone Laboratories, Incorporated - Dept 3315-JFF/512-JAM
Printed in U.S.A.

1. GENERAL

1.01 This specification covers the requirements for the recovery of E1A, E1B, E1C, E1D, E1AM, and E1CM Ringers.

1.02 The applicable requirements of the specification listed on the index as SUPL SPEC shall be followed in the recovery of this apparatus in addition to the requirements specified herein.

Requirements Needing Special Consideration by Telephone Company

1.02A This specification includes certain requirements which need special consideration and, in some cases, action on the part of the telephone company. The paragraph numbers and a brief description of these requirements are shown in the following table.

Paragraph	Requirement
1.03	Conversion
4.05	Conversion

1.03 Unless otherwise specified by the telephone company, all E1A and E1C ringers shall be converted to modular ringers.

1.04 The term "registered" ringer pertains to those ringers which are registered in accordance with Section 68 of the FCC Rules and Regulations.

1.05 Requirements pertaining to "registered" ringers take precedence over all other requirements with respect to the recovery and repair of those ringers which are "registered".

1.06 A "Grandfathered" ringer is defined as one manufactured prior to the implementation of registration and not having a registration label attached to its base.

2. MECHANICAL

2.01 Exterior surfaces of the base may be hand cleaned using KS-14427 Cleaning Emulsion. Care shall be taken to prevent the cleaning emulsion from entering the interior of the base assembly.

General Notes

1. When cleaning the gap between the outer pole piece and the armature, care shall be taken to prevent distortion of the thin reed which is part of the armature hinge lying between the armature and the outer pole piece.

2. Care shall be taken to prevent damage to the interrupter switch on the E1B and E1D Ringers.

2. MECHANICAL (Cont'd.)

2.02 The P-11E103 Cover Screw shall not fall out of the hole in the cover when the cover is shaken while held upside down with the screw in a vertical plane and free to fall of its own weight.

2.03 If it becomes necessary to remove or replace the cover screw, the screw shall be threaded through the cover hole.

2.04 Scratched, chipped, and bare areas on the sides of the base shall be touched up or the entire surface refinished with a matching federal gray lacquer, 657A finish.

2.05 Terminal screws shall be present on unused terminals of the terminal strip assembly. Missing screws shall be replaced with P-43A612 Screws. Washers shall be present on terminals equipped with P-43A392 Screws.

2.06 Terminal designation shall be present and legible.

2. MECHANICAL

2.07 The ringer coil leads, capacitor leads, interrupter leads, and jack leads on modular ringers, shall be connected in accordance with Table A.

TABLE A

Component	Lead Color	E1A, E1C TERMINAL	E1AM, E1CM, E1CMP TERMINAL	E1B, E1D TERMINAL
Ringer Coil	Red	7	7	7
	Black	6	6	6
	Slate	1	1	1
	Slate-Red	1	1	1
Capacitor	Yellow	5	5	5
	White	7	7	7
Interrupter Switch	Blue	---		8
	Brown	---		10
	Green	---		9
652A6 JACK	Green		6	
	Red		5	
	Yellow		2	
	Black		4	
	White		3	
	Blue		8*	
623P4 JACK	Green		6	
	Red		5	
	Yellow		2	
	Black		4	

NOTE: * E1AM & E1CM Ringers which are not equipped with an 8 terminal board assembly shall have the blue lead of the 652A6 Jack connected to a D-161488 connector, insulated and stored.

2.08 The wiring shall be arranged and dressed so that contact cannot be made with moving parts or the ringer gong.

2.09 The clapper rod shall not touch the outer pole piece or the edge of the gong.

2.10 The biasing spring shall not touch the gong or touch or rub the pole piece or interrupter spring.

2.11 There shall be clearance between the volume-control lever and the gong throughout the full range of operation of the lever.

2.12 With the ringer mounted horizontally (base resting on horizontal surface), the volume control lever in the high-volume position, and the biasing spring in the low-tension notch, the armature shall restore to the nonoperate position at all times after being diaplaced manually to the operate position.

2.13 The volume control lever shall require a minimum torque of 3.5 inch-ounces and a maximum of 30 inch-ounces to initiate progressive movement of the control arm throughout the volume control range.

2. MECHANICAL (Cont'd)

2.14 The volume control lever stop shall be positioned as follows:

(a) On E-Type Ringers having a stop and a latch, the stop shall be positioned to prevent the volume control lever from being moved into cutoff. It is permissible for the volume control lever to ride on the leading edge of the cutoff step. The ringer shall meet the low volume ring requirement when stopped by the stop. On these ringers, the latch shall be positioned in the extreme counterclockwise position. The latch shall be capable of holding the volume control lever in cutoff.

(b) On E-Type Ringers having a latch-stop, the latchstop shall be positioned to prevent the volume control lever from being moved into cutoff. It is permissible for the volume control lever to ride on the leading edge of the cutoff step. The ringer shall meet the low volume ring requirement when stopped by the latch-stop. The latchstop shall be capable of holding the volume control lever in cutoff.

2.15 Omitted on Issue 8 of this page (combined in Paragraph 2.14).

2.16 The magnet shall be held securely in place by the tabs on the frame, and in such manner that one end of the magnet is in contact with the inner pole piece. Cracks in the magnet tab shall be permissible provided they do not exceed 50% of the length and 50% of the depth of the tab.

2.17 The coil cover shall not be badly damaged. Slight tears, small holes, and frayed edges shall be repaired by the application of "nonflammable cellulose acetate cement, or nitrocellulose pyroxylin #1 cement. Slight discolorations due to causes other than corrosion are permissible.

2.17A All ringers with stick wound coils shall be equipped with a RS-9164 Clip.

2.18 When a coil is replaced, the insulation shall extend through the eyelet hole flush with the top surface of the eyelet. The free-skinned end shall be soldered to that portion of the twin eyelet where the leadout wires of the coil winding are attached.

CAUTION: Care shall be exercised in the soldering operation to avoid damage to the coil leads.

2. MECHANICAL (Cont'd.)

2.19 On E1A- and E1B-Type Ringers, the clapper shall strike the cam within 1/32-inch of a plane through the center of the cam. The clapper rod shall be adjusted to meet this requirement.

2.20 With the biasing spring in the low-tension notch and the volume control lever in the high-volume position, there shall be perceptible clearance between the clapper and the gong.

2.21 On E1A, E1AM, E1C and E1CM Type Ringers, with the armature in the nonoperate position, the separation between the inner pole face and the armature when measured directly above the center of the rubber bumper shall be maximum 0.079 inch, minimum 0.070 inch.

2.22 On E1B- and E1D-Type Ringers, with the armature in the nonoperate position, the separation between the inner pole face and the armature stop pin shall be maximum 0.039 inch, minimum 0.030 inch.

2.23 The volume control lever on the E1B- and E1D-Type Ringers shall make positive contact against the detent on the base when it is operated to the loud volume position.

2.24 With the armature of the E1B- and E1D-Type Ringers in the nonoperate position, the separator on the interrupter switch shall be from 0.005-inch away to just touching the clapper rod.

2.25 The interrupter switch contacts shall make and break and shall have follow. With the armature in the nonoperate position, the switch contacts a-b shall be open.

2.26 With the volume-control lever of the E1B- and E1D-Type Ringers in the loud volume position, the cut-off contacts c-d shall be closed. With the lever in the cut-off position, the c-d contacts shall be open.

2.27 On all E Type Ringers the P-11E105 Clamp need not be present on the end of the base adjacent to the gong. On E1CM Ringers the P-11E105 Clamp need not be present on either end of the base. ←

2.28 On E1C and E1CM Type Ringers, with the volume-control lever against the low-volume stop, there shall be a clearance between the two parallel surfaces of the cam and the clapper.

2. MECHANICAL (Cont'd.)

2.19 On E1A- and E1B-Type Ringers, the clapper shall strike the cam within 1/32-inch of a plane through the center of the cam. The clapper rod shall be adjusted to meet this requirement.

2.20 With the biasing spring in the low-tension notch and the volume control lever in the high-volume position, there shall be perceptible clearance between the clapper and the gong.

2.21 On E1A, E1AM, E1C and E1CM Type Ringers, with the armature in the nonoperate position, the separation between the inner pole face and the armature when measured directly above the center of the rubber bumper shall be maximum 0.079 inch, minimum 0.070 inch.

2.22 On E1B- and E1D-Type Ringers, with the armature in the nonoperate position, the separation between the inner pole face and the armature stop pin shall be maximum 0.039 inch, minimum 0.030 inch.

2.23 The volume control lever on the E1B- and E1D-Type Ringers shall make positive contact against the detent on the base when it is operated to the loud volume position.

2.24 With the armature of the E1B- and E1D-Type Ringers in the nonoperate position, the separator on the interrupter switch shall be from 0.005-inch away to just touching the clapper rod.

2.25 The interrupter switch contacts shall make and break and shall have follow. With the armature in the nonoperate position, the switch contacts a-b shall be open.

2.26 With the volume-control lever of the E1B- and E1D-Type Ringers in the loud volume position, the cut-off contacts c-d shall be closed. With the lever in the cut-off position, the c-d contacts shall be open.

2.27 The P-11E105 Clamp need not be present on the end of the base adjacent to the gong.

2.28 On E1C and E1CM Type Ringers, with the volume-control lever against the low-volume stop, there shall be a clearance between the two parallel surfaces of the cam and the clapper.

2. MECHANICAL (Cont'd.)

2.29 On E1D-Type Ringers, the cut-off spring shall not touch the resonator assembly or terminal plate assembly in either the operated or nonoperated position.

2.30 Defective terminal plate assemblies on E1A- and E1B-Type Ringers may be replaced with terminal plate assemblies for E1CM and E1D-Type Ringers, respectively, when P-11E107 and P-12E188 Assemblies are not available.

2.31 E1A Ringers or E1A Ringer converted to E1AM which are equipped with terminal plate assemblies used on E1C or E1CM type ringers shall have the code E1A (E1AM if converted to modular) stamped on the back of the base located as specified in Paragraph 5.02.

2.32 E-Type Ringers may be reissued with the "bridge" across the cord slot missing, provided the edges are smooth.

3. TESTS AND ADJUSTMENTS

3.01 The ringer shall be tested in the horizontal position (base resting on horizontal surface) by applying combinations of voltage, series resistance, biasing spring position, and volume control lever position, as shown in Table B.

TABLE B

Function	Requirement	AC(20cps) Voltage	Res Ohms ± 2%	Tension on Biasing Spring Notch	Position of Volume Control Lever
Operate	(a)	43	760	Low	High
Nontap	(b)	41 or 43	370 or 850	High	High
Ring	(c)	60	None	High	Low to High

(a) The ringer shall start and continue to operate with the clapper striking the gong. Irregularities and interruptions in striking the gong are not objectionable, and recognition of the sound volume is not a requirement.

3. TESTS AND ADJUSTMENTS (Cont'd.)

(b) The clapper shall not tap the gong. Fluttering or vibration of the clapper may be disregarded.

(c) The ringer shall operate in the following manner:

(1) With the volume control lever approximately 1/16-inch from the extreme cutoff position, the ringer shall not ring.

(2) With the volume control lever stopped by the stop cam in the low volume position, the ring shall start and the volume shall increase as the control lever is moved to the high volume position.

(3) The volume control lever shall remain in the maximum volume position.

NOTE 1: The series resistance values specified include the internal impedance of the voltage source.

NOTE 2: The total waveform distortion of the source voltage shall not exceed 3 percent.

3.02 If a magnet or armature and clapper assembly is replaced, the magnet shall be fully magnetized and stabilized by demagnetization to a condition which will permit a biasing spring adjustment to satisfy the (a), (b), and (c) requirements of Table B.

3.03 All E Type Ringers shall meet an insulation breakdown test as specified in paragraph a or b.

(a) The current that flows when a potential of 1000 volts RMS 60 Hz is applied between the simplexed telephone connections (tip and ring) and exposed conducting surfaces of "registered" ringers shall be as specified in X-17986, Issue 3.

(b) "Grandfathered" ringers shall meet requirement 3.03 (a) except that the test potential may be 500 volts 60 Hz with the resultant current flow as specified in specification X-34, supplement C.

3. TESTS AND ADJUSTMENTS (Cont'd)

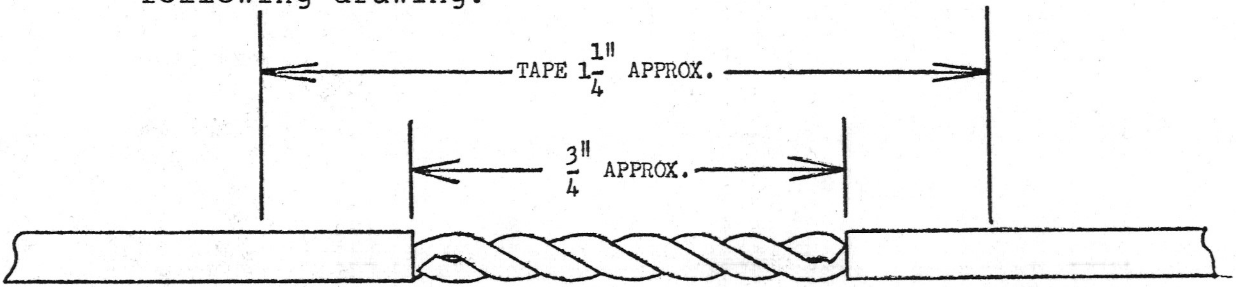
3.04 The ringer shall be issued with the biasing spring in the high tension notch.

3.05 Omitted on Issue 2 of this page (combined in Paragraph 2.14).

3.06 Splicing of Component Leads

The leads on components in ringers, other than those of tinsel ribbon conductor construction, shall be permitted to be spliced rather than replaced provided the following conditions are met.

1. Leads shall be spliced with solder connections.
2. The solder splice shall be in accordance with the following drawing.



3. Removal of outer insulation shall not result in damage to a solid wire conductor or remove more than two strands of a stranded wire lead.
4. The older spliced area shall be insulated by wrapping two complete turns of plastic electrical tape around the wire so that the tape overlaps the wire insulation on both ends of the splice by at least 1/4 inch.
5. The conductor lead used for the splice shall be of the same type and color as the lead on the component.
6. The overall length of the lead after splicing shall be within plus or minus 1/2 inch of the nominal lead length for the manufactured product.
7. No more than three leads shall be permitted to be spliced. This is an addition to the number of splices permitted for cords as covered in the applicable BSRS.

3.07 Splicing of component leads with B-Wire connectors is permitted.

4. MODIFICATIONS AND CONVERSIONS

4.01 The addition of options to "registered" ringers is permissible only when the combination has previously been registered.

4.02 Modifications which would change the basic registration of the ringer are not permitted.

CONVERSION OF REGISTERED RINGERS

4.03 The conversion of a "registered" ringer to another code is permissable provided the ringer is converted to a registered type, the parts used are approved for use and the converted ringer satisfies all BSRS requirements applicable to the new code. The old registration label shall be removed, if not applicable to the new code, and the appropriate new registration label shall be applied to the ringer. The original date of manufacture shall remain on the set.

4.04 The conversion of a "registered" ringer to a "Grandfathered" ringer or a "Grandfathered: ringer to a "registered" ringer is not permissible.

CONVERSION OF NON MODULAR RINGERS

4.05 Unless otherwise specified by the telephone company, the E1A and E1C ringers shall be converted to modular ringers as follows:

4.06 The ringers shall be equipped with a new or refurbished cover, one 841026552 (lt. olive gray) or one 841026560 (ivory), and one jack 102091048 (623P4) and one jack 102904745 (652A6).

4.07 The jack leads shall be connected to the terminal board as shown in Table A. The terminal board need not be changed to provide the eight (8) terminal; instead the blue power lead of the 652A6 jack shall be connected to the D-161488 connector, insulated and stored.

4.08 The converted ringers shall be stamped E1AM and E1CM, respectively. Reference paragraph 5.02(B).

5. MARKING

5.01 If the volume control marking, LOUDER, is missing or illegible, new marking shall be applied with "white ink." The arrow shall be 3/8-inch long and the lettering in 1/8-inch characters. The marking shall be adjacent to the volume control lever cutout in the base and shall extend downward with the ringer in the normal operating position.

5. MARKING (Cont'd.)

5.02 All "Grandfathered" ringers shall be marked on the base in the following manner.

(a) The product code shall be present on the base.

1. If labels are used to designate the marking, the date of manufacture shall be covered over by the label.

2. If ink stamping is used, the date of manufacture shall be removed from the outer surface of the base.

(b) On ElB, ElC, ElCM (not registered), ElD or ElA ringers having an ElC or ElCM terminal board assembly the code marking shall be present on the back of the base. ElA Ringers which are converted to ElAM shall have the code marking "ElAM" present on the back of the base. If the code is missing or illegible, new marking shall be applied in 1/8-inch red characters located in the area between the grommets and the gong mounting hole at the volume-control end of the base.

(c) All required markings shall be readable under average lighting conditions.

(d) Either adhesive-backed printed labels or ink stamping shall be used to designate the code and/or repair date.

5.03 On registered ElCM ringers, the KS-22064Ll registration label with registration number AS593M-70043-oT-N and ringer equivalent of 1.04, ringer code, and original date of manufacture shall be retained. If any of these markings are unreadable under average lighting conditions, they shall be restored as specified when issued as new product.

6. PACKING

6.01 An information sheet (ClB-25B14F)shall be packed with each registered ringer.